

Appl. No.: 10/543,029
Amdt. dated December 9, 2008
Response to Office Action of June 9, 2008

REMARKS IN RESPONSE TO THE OFFICE ACTION

This amendment is responsive to the Office Action dated June 9, 2008. Claims 1–14 and 16–25 are pending in the application, with Claims 1 and 14 being independent claims. Claims 1–10, 13, 14, 16–22, and 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,054,992 to Ballas et al. (“Ballas”) in view of U.S. Patent No. 6,314,848 to Morabit et al. (“Morabit”) and U.S. Patent No. 6,401,344 to Moore et al. (“Moore”). Claims 4, 5, 16, 17 are also rejected as obvious in view of the above-cited references.

Applicant thanks the Examiner for the courtesies extended during the telephonic interview conducted on December 8, 2008. During the interview, possible amendments to Claim 1 were discussed in view of the cited art, and the rejections included in the Office Action of June 9, 2008, were explained in greater detail by the Examiner. In particular, the Examiner indicated that an amendment to recite a second curved portion having a radius of curvature that is different than the radius of curvature of the first curved portion would overcome the rejections of the current Office Action. The Examiner’s suggestions are incorporated as new Claim 31.

Applicant respectfully requests reconsideration of the claims in view of the amendments already set forth herein and in view of the Remarks set forth in the following.

Amendments to the Specification

As discussed with the Examiner during the telephonic interview, the specification has been amended to describe the curved portion shown in Fig. 4 proximate opening 113. As such, the amendment to the specification is not new matter, but merely puts in textual form the disclosure of Fig. 4.

Claimed Invention

Independent Claims 1 and 14 relate to cutting heads that include passageways for cutter strings. The head of Claim 1 is characterized in that the passageway extends along an axis (A)

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that is spaced a distance (D) from an axis of rotation (C) of the head and presents an inner edge configured to engage a trailing edge of the string. The head of Claim 14 is similarly characterized in that the passageway extends along an axis (A) that is spaced a distance (D) from an axis of rotation (C) of the head. In Claim 14, the curved portion presents, at least locally, a radius of curvature (R) that is greater than the distance (D). An example of these features is illustrated in the present application at least in FIG. 4, wherein the passageway "112" extends along the axis "A," which is spaced a distance "D" from the axis of rotation at the center "C" of the cutting head.

New independent Claim 26 is directed to a cutting head with a passageway that is similarly spaced a distance (D) from the axis of rotation (C) of the head. In addition, the passageway recited in Claim 26 includes an opening for the string located opposite the exit region. The head is configured such that the cutter string projects outside of the head from the exit region only. New Claims 27–29 depend from new independent Claim 26. Claims 26–29 are supported by the specification in Fig. 4 and at page 14, lines 23–27.

New independent Claim 30 also recites a cutting head with a passageway that is spaced a distance (D) from the axis of rotation (C) of the head. In Claim 30, the curved portion presents a recessed profile that is suited to the cross-section of the cutter string so as to maintain the orientation of the cutter string. Claim 30 is supported by the specification in Fig. 8A and at page 12, lines 8–15.

Applicant also presents new independent Claim 31 for the Examiner's consideration. New independent Claim 31 incorporates the suggestions provided by the Examiner during the telephonic interview of December 8. In particular, Claim 31 recites a first curved portion extending between an opening and the peripheral region of the head and a second curved portion extending between an exit region opposite the opening and the peripheral region of the head. The radius of curvature of the second curved portion is different from the radius of curvature of the first curved portion, as shown in Fig. 4. The specification has been amended as described

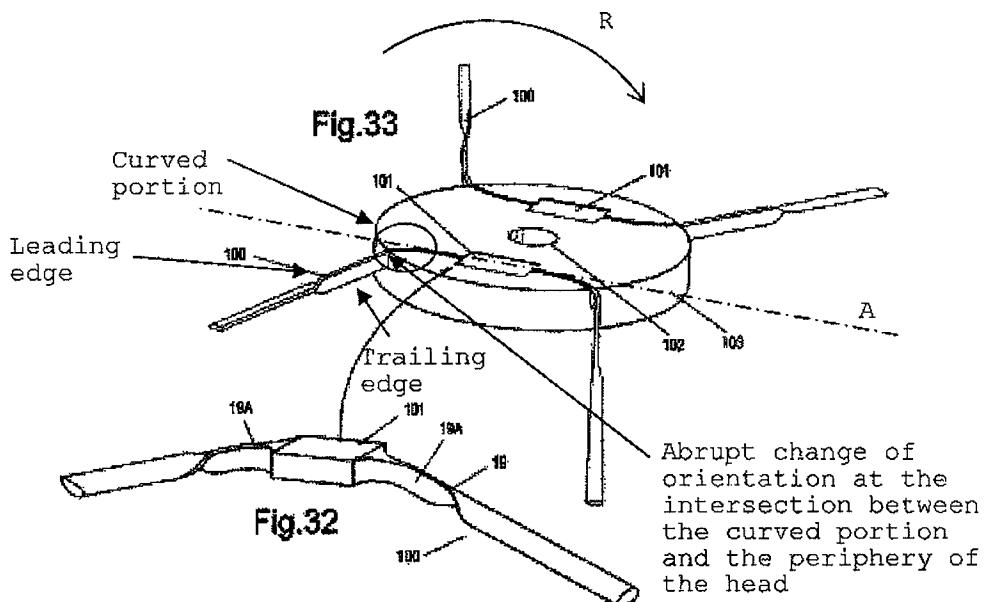
above to include a description of the first curved portion, which is supported by the original disclosure of Fig. 4, as noted by the Examiner during the telephonic interview.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 1–10, 13, 14, 16–22, and 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ballas in view of Morabit and Moore. Claims 4, 5, 16, and 17 are also rejected as obvious in view of the above-cited references. Applicant submits that the rejection of Claims 1–10, 13, 14, 16–22, and 25 and Claims 4, 5, 16, and 17 is improper and should be withdrawn for the reasons described below.

In the Ballas patent, cutter strings extend along axes that intersect, and are not spaced from, the axis of rotation.

The Morabit patent discloses (referring to Fig. 33) a head for a vegetation cutter configured to hold a cutting string segment (100). The passageway extends along an axis that is spaced a distance from an axis of rotation (axis of the mounting opening (102)) of the head so as to present an inner edge constituted by its edge closest to said axis, as reproduced below.



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However, in the cutting head of Fig. 33, the inner edge engages the leading (and not the trailing) edge of the string while the head is rotating. As can be understood from Fig. 33, the cutting head rotates clockwise (arrow R) and the trailing edge engages the outer edge of the passageway (i.e., the edge which is farthest from the axis of rotation), whereas the leading edge is situated against the inner edge of the passageway.

The consequence is that, contrary to the claimed invention of Claims 1 and 14, the trailing edge does not find any support during cutting, because of the abrupt change of orientation at the intersection between the curved portion and the periphery of the head. Hence, the effect of reducing the fatigue of the string, which is the aim of the present invention, cannot be achieved by Morabit.

Claim 14 further differs from Morabit in that, in Claim 14, the radius of curvature of the curved portion is greater than the distance between the passageway and the axis of rotation of the cutting head. There is no teaching or suggestion in Morabit that the radius of curvature should be greater than the distance between the passageway and the axis of rotation.

Similarly, Moore shows (for example, in Fig. 8) a cutting head for a line trimming apparatus, including a channel (5) for a trimming filament (39) and a support surface (13 in the lower part of Fig. 8) for supporting the string extending between an opening (5a, 5b) and a rim (14) of the head. The channel (5) presents an edge that engages a trailing edge of the filament while the head is rotating (see the position of the filament (39) during rotation of the head in dashed lines in the lower part of Fig. 8). Furthermore, Moore discloses that “the opposed end portions of the first clamp wall 4 and the second clamp wall 4a are each curved generously to define a curved filament contact and support surface 13.” (Col. 4, lines 23–28).

The cutting head recited in Claim 1 and in Claim 14 differs from Moore in that the passageway extends along an axis that is spaced a distance from an axis of rotation of the head so as to present an inner edge constituted by its edge closest to said axis of rotation.

The combination of Morabit and Moore with Ballas does not lead to the invention. Indeed, starting from Fig. 8 of Moore and trying to implement two cutting strings in the cutting

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head, one skilled in the art would have applied the arrangement of Fig. 33 of Morabit. Schematically, the modification consists in moving the channel (5) of Moore downwards (referring to Fig. 8) to bring it nearer to the lower part of the rim (14) of the cutting head. This would have led to a reduction of the radius of curvature of the support surface (13) because there would have been less room for the support surface. Moreover, the edge that would have engaged the string during rotation of the cutting head would have been the outer edge of the passageway (and not the inner edge).

Hence, one skilled in the art would not have been led to modify the cutting head of Moore with Morabit to obtain the cutting head according to the invention.

Conversely, starting from Fig. 33 of Morabit and trying to reduce the fatigue of the cutting string during rotation of the cutting head, the person skilled in the art would have tried to “curve generously” the curved portion in order to create a support surface for the trailing edge of the cutting string. As can be seen in Fig. 33, one would have been obliged to move the passageway nearer to the axis of rotation of the cutting head in order to have enough room to make the curve.

Furthermore, if this were done, the edge of the passageway that would have engaged the trailing portion of the string would have been the outer edge of the passageway (and not the inner edge).

If one had moved the passageway opposite to its initial position (relative to the axis of rotation of the cutting head), the result would have been that an inner edge of the passageway would engage the trailing portion of the string when the cutting head rotates. However, this arrangement leads to a crossing of the two cutting strings, which does not work.

Hence, Ballas, Morabit, and Moore, taken alone or in combination, do not render Claim 1 or Claim 14 obvious. Claim 14 further differs from the prior art in that the radius of curvature of the curved portion is greater than the distance between the passageway and the axis of rotation of the head. None of the cited documents anticipates this feature. Thus, for at least these reasons, Claims 1 and 14, and the claims that depend therefrom, are patentable over the cited references.

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New Claims 26–31 are patentable over the Cited References

As mentioned above, independent Claims 26, 30, and 31 have been added to the application. Claims 26, 30, and 31, and the claims that depend therefrom, are patentable over the cited art for the reasons described above, as well as in view of the following.

New independent Claim 26, and Claims 27–29 which depend therefrom, recite that the head is configured such that the cutter string projects outside of the head from the exit region only. This feature allows the curved portion (120) shown in Fig. 4 to have a larger radius of curvature than would otherwise be possible by providing for the outlet of the exit region (115) to be recessed from the peripheral region of the head. In this way, the curved portion is able to provide support for the cutting string in operation, reducing fatigue as previously described.

None of the cited references, alone or in combination, teach or suggest a cutting head having two opposed openings where the cutting string exits the head from one opening only. For example, in Ballas, each of the figures depicts cutting string exiting the head from both openings (46). Likewise, in Morabit and Moore, the string projects outside the head from both openings of the passageways (see, e.g., Fig. 33 in Morabit and Fig. 8 in Moore). Thus, for at least this reason, Claims 26–29 are patentable over the cited references.

Furthermore, none of the cited references, alone or in combination, teach or suggest a recessed profile presented by the curved portion that is suited to the cross-section of the cutter string so as to maintain the orientation of the cutter string, as recited by independent Claim 30. Thus, for at least this reason, Claim 30 is patentable over the cited references.

Finally, as discussed with the Examiner during the telephonic interview of December 8, none of the cited references, alone or in combination, teaches or suggests two curved portions with the radius of curvature of the second curved portion being different from the radius of curvature of the first curved portion, as recited by independent Claim 31. Thus, for at least this reason, Claim 31 is patentable over the cited references.

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Conclusion

In view of the remarks and amendments presented above, it is respectfully submitted that Claims 1, 14, 26, 30, 31, and all the claims depending therefrom (*i.e.*, Claims 2–13, 16–25, and 27–29) are in condition for allowance. It is respectfully requested that a Notice of Allowance be issued in due course. The Examiner is requested to contact Applicant's undersigned attorney to resolve any remaining issues in order to expedite examination of the present application.

The patentability of the independent claims has been argued as set forth above and thus Applicant will not take this opportunity to argue the merits of the rejection with regard to specific dependent claims. However, Applicant does not concede that the dependent claims are not independently patentable and reserves the right to argue the patentability of dependent claims at a later date if necessary.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,



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